

**ABSTRACT OF THE DISCLOSURE**

5 The present technique provides a variety of processing schemes for decomposing soft tissue and bone images more accurately from low and high-energy images acquired from an imaging system, such as a dual-energy digital radiography system using flat-panel technology. In particular, a modified decomposition process is provided to mitigate noise and to reduce contrast artifacts, such as blooming, while decomposing soft tissue and bone images from low and high-energy images.